

The Contribution of the Merger Guidelines to the Analysis of Non-Horizontal Mergers

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While “Nuttin, Honey,” might be a natural response, it would be both ungracious and unimaginative. It is true that the analysis of non-horizontal mergers in the Guidelines has not been a hot topic. The non-horizontal section (Section 4: Horizontal Effect from Non-Horizontal Mergers) in the 1982 Guidelines was essentially reprinted in the 1984 Guidelines, and then disappeared in the (aptly named) “Horizontal” Merger Guidelines of 1992. Thus the Non-Horizontal section of the 1984 Merger Guidelines remains the official position of the DOJ and the FTC on potential entry and vertical mergers.²

As the title of Section 4 made clear, the ‘82 Guidelines regarded non-horizontal mergers as of interest for antitrust policy only insofar as they had horizontal effects. The Guidelines identified two situations under which the Department might challenge a non-horizontal merger: where the merger would eliminate a specific potential entrant, and where a vertical merger would raise barriers to entry, facilitate collusion, or allow a monopoly supplier to evade rate regulation. This represented a major shift from the relative hostility to vertical integration exhibited in the 1968 Guidelines, which regarded as problematic a vertical merger between firms accounting for only 10% and 6% of sales in their respective markets. In contrast, the ‘82 Guidelines stressed that non-horizontal mergers were of concern only if they had horizontal effects, and that a precondition for such an effect was the presence of certain structural characteristics at both levels, with significant market power at one level at least.

For a conglomerate or “potential competition” merger, this involved a relatively straightforward adaptation of the horizontal merger criteria to a world where entry was only probabilistic. In that event, a somewhat higher market power threshold was appropriate, i.e., a challenge was unlikely unless market concentration was “high” (in 1982, this meant an HHI of over 1800³) and entry by the firm currently outside the market was particularly likely or only one other firm had the same or comparable advantage in entering.

For a vertical merger, the only concerns identified were that a vertical merger could raise entry barriers, facilitate collusion, or allow monopoly public utilities to circumvent rate-of-return regulation. For non-regulated firms, the *Guidelines*’ focus was on vertical mergers that could facilitate what would be referred to today as “coordinated effects” at the primary level, and thus relied on the HHI as the relevant measure of concentration. The *Guidelines* stressed that high concentration at the primary level (i.e., an HHI over 1800) was a precondition for any anticompetitive effect under all scenarios. A vertical merger could raise entry barriers only if entry into the primary market post-merger would require simultaneous entry at the secondary level, and this requirement would significantly increase the difficulty of entry. Simultaneous entry would likely be considered to be necessary if the remaining unintegrated capacity at the secondary level post-merger could serve at most one minimum-efficient-sized plant at the primary level. Collusion could be a concern for vertical mergers into retailing where a “large”

percentage of the upstream product would be sold through vertically-integrated retail outlets, or where the merger eliminated a disruptive buyer. Finally, while the Guidelines thus did recognize a limited number of scenarios under which foreclosure of rivals from the secondary level could enhance market power at the primary level, the Guidelines were silent on the possibility that vertical integration by a firm with monopoly power at one level might enable that firm to “leverage” its monopoly power into an additional monopoly at the secondary level.

I. Potential Competition

Eliminating a potential entrant through merger could result in higher prices if either the acquired firm is likely to enter (“actual potential competition”) and entry would lower prices, or incumbents are not charging higher prices because higher prices would increase the probability of entry (i.e., limit pricing or, in the terms of the Guidelines, “perceived potential competition”).

(a) *“Actual” potential competition.*

Analyzing “actual potential competition” requires an estimate of both the probability of entry (absent the merger) and the effect of that entry. However, since the same concepts and methodology can be used to assess the probability and effect of entry when evaluating an “actual potential competition” argument against a “non-horizontal” merger as when evaluating entry as a defense of a horizontal merger between two firms in the market,⁴ parties seeking to understand how the Agencies currently assess the likelihood and effects of entry can turn to Sections 1 and 3 of the ‘92 Guidelines for a discussion of sunk costs, the timeliness, likelihood or sufficiency of entry, and how the Agencies are likely to evaluate the effects of that entry.⁵

(b) *“Perceived” potential competition.*

Limit pricing (“perceived potential competition”) has always suffered, at least in principle, from the problem that the entrant cares only about prices post-entry. As long as incumbents can (or potential entrants believe they would) fully adjust their prices by the time entry actually occurs, higher pre-entry prices do not imply higher post-entry prices and thus should not encourage entry. With the probability of entry unaffected by current prices, the best strategy is to “make hay while the sun shines.”⁶ There may be many ways to convince potential entrants that post-entry prices will be too low to support entry (e.g., hold excess capacity, acquire a reputation for cutting prices drastically in response to entry, etc.), but keeping prices low today would seem to be a singularly ineffective and expensive way to do so.⁷

(c) *Potential competition from suppliers of complements: vertical mergers with monopoly power in both markets.*

The exception is where the potential entrant has monopoly power over a vertically-related or otherwise complementary product,⁸ in which case the profitability of entry does depend on the pre-entry price. Entry by an (upstream or downstream) monopolist that results in lower prices simply shifts profits to the level from which entry occurred. The greater the potential price

reduction from entry, the greater the incentive to enter.

Price reductions from entry are likely to be greatest in industries with high fixed costs, making software the paradigmatic case. At the extreme, under Bertrand competition and with no consumer switching costs and homogeneous consumer preferences, entry with an equal-value product forces all prices down to zero, making competition “in the market” suicidal. If all other vertical stages (or complementary parts of the “system”) are competitive, that price reduction is passed on to consumers. But if at least one complement used in fixed proportions is monopolized, that firm can appropriate the entire price reduction in the form of a higher price for its product.

A vertically-related monopolist is thus not only the most dangerous potential entrant but also the only potential entrant whose entry can be forestalled by restraining prices pre-entry to below what would otherwise be the profit-maximizing level. The archetypal example is probably Microsoft and Intel. Each has monopoly power in a critical component of the PC system that is used in fixed proportions with the other firm’s product. Each thus has a strong incentive to enter (or to support entry by others) into the other’s product market, provided that such actions do not lead to similar actions (or retaliation) by the other. And the incentive for each to do so is proportional to the extent to which each firm tries to raise prices “too far,” especially if it results in system prices above the joint profit-maximizing level. A merger between two such firms could be expected to reduce both “actual” and “perceived” potential competition.

The apparent contradiction between this conclusion and the standard result (i.e., that a merger between successive or complementary monopolies results in both lower prices and higher profits⁹) is, as usual, due to a couple of critical assumptions.¹⁰ Most important, the standard successive monopoly theorem assumes that both monopolies are “secure.” In that case, there is no perceived or actual potential competition to restrain current pricing by either firm, and the only alternative to successive monopoly is a single monopoly. But in the real world, monopolies, especially in markets characterized by rapid technical change, are seldom secure, and even if they appear so to outsiders, seldom seem so to the monopolist.¹¹ There are too many examples of single-stage monopolies lost,¹² and of multiple-stage monopolies that have survived “on one engine,”¹³ for any prudent manager to regard having two complementary monopolies as any more redundant than having a backup electrical system on a mission to the moon.

Second, the standard successive monopoly story also assumes that complementary monopolies in a repeated game continue to price parametrically (i.e., each of the complementary monopolists adjusts his prices under the assumption that his counterpart would continue to sell at his former price), rather than evolve into a partnership in which they price so as to maximize joint profits and then bicker over the shares (i.e., bargain over both price and quantity). While this might be a reasonable assumption when a single monopoly at one level faces a number of separate monopolies at a second level (e.g., a monopoly newspaper whose distributors have exclusive territorial franchises), parametric pricing becomes increasingly unlikely in small-number situations or where other solutions (e.g., maximum resale price maintenance, at least since *Kahn*) are available.¹⁴

To return to my personal favorite example, internal Microsoft documents identify Intel as the potential entrant of greatest concern. As one e-mail explained:¹⁵

If they [Intel] decide to own the OS as well as the CPU our business is it will get ugly. This could be an INTEL lead and funded coalition - say with Compaq and NSCP. I am convinced that they have been thinking about this for some time. They could buy SUN SOFT or start a skunk work project on their side. If they decide to sell the OS for \$ 1 and the CPU for \$ 200 they will get the OEMs on their side. The customer inertia argument remains and that would prevent them to build momentum easily. Our reaction could be to buy Nsemi or AMD or both and own the CPU and the SW business - while both stocks (INTEL and MSFT) are taking a dive. We would sell SW at \$ 100 and the CPUs at costs + \$1. How sure are we of our partnership and how fast could we react if needed? We could bring compatibility to another platform better than anybody else and we would have the money to fund the fab capacity.

It would thus be most interesting to see how the Agencies would analyze a merger between Microsoft and Intel under the Guidelines framework, given that such a merger would almost certainly have to be challenged in practice.¹⁶

II. The Vertical Merger Guidelines

All guidelines reflect a benefit-cost analysis, explicit or implicit, for introducing a test or anticompetitive scenario. This analysis involves weighing the probabilities and costs of false positives against the probabilities and costs of false negatives. The results of this balancing process are highly sensitive to new economic learning, both theoretical and empirical.

Well before 1982, that balance for evaluating vertical mergers had swung heavily toward a greater recognition of the cost of false positives (i.e., treating mergers as anticompetitive when they are not) and a widespread discounting of the potential for false negatives (i.e., failing to deter anticompetitive vertical mergers) and their costs. A stream of economics and legal articles from what can loosely be described as the “Chicago School” had provided theoretical and empirical evidence of how every known form of vertical control¹⁷ can be the optimal instrument to achieve efficiencies, enhance competition, and improve consumer and social welfare. The competitive effects of vertical control could no longer be determined simply by identifying the particular form of vertical control.¹⁸ As our understanding of vertical control improved, it became clear that much of the policy toward it, including vertical mergers, was based simply on an assumption that, like witchcraft, what we did not understand must be bad.¹⁹ While non-ownership vertical restraints (especially those involving prices) were the primary victims of this ‘default to evil,’ it had infected policy toward vertical mergers as well. The growing recognition of the potential for efficiencies from all forms of vertical control, including vertical integration through merger, meant that long before 1982 it had become clear that a shift in policy that would reduce the costs of false positives was very much in order.²⁰ Indeed, the motto that would come to best express the Reagan administration’s approach to antitrust policy was the medical principle of “*primo non nocere*.”²¹

The first effect of that revision was a greater recognition that vertical control could be of concern only if it had horizontal effects, and that a precondition for such effects was that the firm or firms that were vertically integrating or imposing the vertical restraint must already have horizontal market power, whether unilateral or collective. While few would have disputed this in principal, the critical issue for policy is the level of market power that should be taken as a threshold. The higher that threshold, *ceteris paribus*, the lower the risk of a false positive, and the higher the risk of a false negative. The reappraisal of both these probabilities thus implied that, when evaluating a vertical merger, the threshold for horizontal market power at the primary level should be raised significantly.

The second and more controversial development was the reevaluation of the potential for vertical restraints by a firm or firms with market power at one level either (1) to protect or enhance horizontal market power at that level and/or to allow it to be exploited more profitably, especially through “vertical foreclosure” strategies, or (2) to gain a “second” horizontal monopoly at a vertically related level (or, more generally and accurately, to gain a monopoly over a complementary product), i.e., the “leveraging” scenario.

(a) Protecting or enhancing horizontal monopoly power: regulatory evasion, price discrimination and foreclosure.

Regulatory evasion

The ‘82 Guidelines recognized that vertical integration (or other forms of vertical control) could be used to evade rate-of-return regulation. Evasion of regulation was generally accepted both as clearly problematic and easily identifiable (and thus not susceptible to false positives), and therefore appeared as a separate section in the Vertical Merger Guidelines.²²

Price discrimination

Vertical control (especially tying, but also vertical integration) to facilitate price discrimination has been ubiquitous, especially in the sale of patented products. Given the prevailing view of the time that intellectual property was insufficiently protected,²³ and that the welfare effects of price discrimination were either unambiguously positive (first-degree price discrimination²⁴) or indeterminate (third-degree price discrimination), price discrimination in the sale or use of intellectual property, whether protected by patents or not, was viewed as beneficial or at least benign.²⁵ As a result, it was deemed important to ensure that the presence of legally protected intellectual property rights not be treated as a sufficient condition to establish horizontal market power for the purposes of evaluating vertical mergers under the *Guidelines*.

Formulating Guidelines toward vertical control by firms in oligopolistic markets, as opposed to secure monopolies, however, was a more difficult task. The ‘82 Guidelines identified two routes through which vertical control might have anticompetitive effects in such markets: facilitating collusion and foreclosure to raise entry barriers.

Facilitating Collusion

The '82 Guidelines offered two scenarios where vertical mergers might facilitate collusion. First, where retail prices are more visible than prices in upstream markets, ubiquitous vertical integration into retailing might facilitate collusion among upstream firms by making it easier for them to monitor prices. Second, where a large downstream buyer has been able to induce upstream firms to compete more vigorously or to “cheat” on explicit or implicit agreements not to compete, elimination of such a “disruptive” buyer through a vertical merger might facilitate collusion.

While the Guidelines discuss the potential for a vertical merger to facilitate collusion only in the context of a vertical merger into retailing, this can be interpreted as simply exemplifying a general concern that vertical mergers might increase anticompetitive coordination. Thus, in evaluating the acquisition of McCaw by AT&T, one concern was that AT&T was the key cellular equipment supplier to several RBOCs, a relationship which requires close coordination and extensive exchange of strategic and other information, but those RBOCs were also McCaw's sole competitors in many cellular service markets. The decree negotiated by the Department thus provided for a firewall to prevent the passage of confidential information and established conditions that increased the RBOC's ability to switch out of AT&T equipment.²⁶

The potential for a vertical merger to facilitate collusion – in this case, at both levels – was also one of the concerns raised in the proposed acquisition of Masonite (the second-largest manufacturer, and the primary supplier in the merchant market, of “interior molded door-skins” a critical input into the manufacture of doors) by Premdor (the second-largest manufacturer of “interior molded doors,” and a small but significant participant in the upstream market through a joint venture). The DOJ's concern was that vertical integration between these two firms would facilitate coordination with their primary rival, the leading firm in both markets, which was already vertically integrated. That coordination would be facilitated (a) in the upstream market, where coordination between Masonite and the leading firm could be frustrated if an independent Premdor responded by expanding its output of doorskins, (b) in the downstream door market, where coordination between Premdor and the leading firm could be frustrated if an independent Masonite expanded its sales of doorskins to smaller, independent door manufacturers,²⁷ (c) in both markets, by more closely aligning the cost structures of the new merged firm and the leading firm, and (d) in both markets, by eliminating information asymmetries.²⁸

It is important to note, however, that while some vertical mergers may facilitate oligopolistic coordination, firms may also vertically integrate or merge in order to evade oligopolistic coordination or cheat on a collusive agreement. One example is provided by the wave of acquisitions by cement companies of concrete firms in the 1970s, a merger wave that set off concerns at the FTC that these mergers were facilitating coordination or even collusion, or perhaps foreclosure. On closer examination, however, it appears that cement firms were acquiring concrete companies in order to evade oligopolistic discipline in maintaining cement prices.²⁹ It is hard to think of a clearer example of the cost of false positives.

Foreclosure to raise entry barriers

With respect to foreclosure to raise entry barriers, the Guidelines required evidence of significant market power at the primary level, although the structural indicia used was the HHI rather than a measure more appropriate to the exercise of unilateral market power. At the secondary level, the Guidelines required evidence of significant barriers to entry.³⁰ The underlying assumption was that foreclosure could raise barriers to entry at the primary level by forcing the entrant to enter at both levels, but that integration would not raise entry barriers at the primary level if either (a) entry at the secondary level were easy or (b) post-merger, sales by unintegrated firms in the secondary market would be sufficient to service two minimum-efficient-scale plants in the primary market.

As experience has shown, this is not the only mechanism by which a firm with monopoly power at one stage can protect or maintain that monopoly by vertical control, including vertical mergers, and thus an exclusive focus on the size of the “non-foreclosed” secondary market (as opposed to the size or share of the foreclosed market) can generate false negatives. The clearest recent example would have been the acquisition of Netscape by Microsoft.³¹ The effect would have been to significantly increase barriers to entry into the operating system market, but not because the merger would have deprived customers of rival operating systems from access to alternative independent browsers. Instead, a sufficiently large share of the browser market controlled by Microsoft would have enabled Microsoft to preempt the development of applications that could be used on rival operating systems. In their defense, however, the authors of the ‘82 Guidelines can hardly have been expected to anticipate the advances in the analysis of network effects (economies of scale in demand) that underlie the understanding (at least by economists) of the potential anticompetitive effects from such a merger. Moreover, the basic insight that foreclosure to raise entry barriers or otherwise maintain or solidify monopoly power at one level requires both monopoly power at one level and minimal structural conditions at the secondary level survives, even if the set of those structural conditions may have expanded somewhat with experience.

The potential for foreclosure scenarios to generate false positives is exacerbated by the fact that all firms selling a product at a price above its marginal cost, whether because they have market power or simply because the product is differentiated, have an incentive to try to induce firms at the downstream level to increase the level of effort devoted to their product.³² This is essentially a variant of the variable proportions problem, discussed below. The problem is that the downstream firm ignores the effects of its decision on the profits of the upstream firm.³³ Thus all producers of differentiated products would like retailers to devote more shelf space or other inputs to their product than the retailer would choose to supply absent special inducements, and all such upstream firms have an incentive to try to influence retailers’ decisions through some form of vertical control including, if necessary, vertical integration. Since the incentive to integrate is greater, the greater the incremental margin, it is not surprising that the most important and controversial mergers among suppliers of complementary products have been in software, media, and telecommunications, where the share of fixed costs can be extremely high at one or more levels, at least *ex post*.³⁴ These conditions can provide an incentive for vertical mergers even absent monopoly power at any level.

As a policy and legal matter, the difficulty is in distinguishing in practice between a manufacturer's efforts to induce downstream firms to provide more inputs to his own product, versus trying to induce the downstream firm to provide less to his rival, two efforts that have opposite implications for welfare but which are in practice often difficult to distinguish, especially if vertical control takes the form of ownership (vertical integration) as opposed to contractual restrictions. This has been the central problem in dealing with the recent spate of media mergers. While those mergers have provoked a literature too extensive to be adequately reviewed here, it is interesting to note that these mergers would arguably not have been challenged under the methodology and screens laid out in the Vertical Merger Guidelines.³⁵

In telecommunications, one example of Division intervention has been the Sprint/France Telecom/Deutsche Telecom transaction, which involved a joint venture between Sprint and DT (together with a large purchase of stock in Sprint by FT and DT) to provide global telecommunications services. The concern was that the vertical relationship between FT and DT on the one hand and Sprint on the other could provide incentives for the parties to discriminate against competitors in access to monopoly networks in France and Germany. The Division negotiated a consent decree aimed at restricting the parties' ability to discriminate against other firms seeking access to the French and German markets, by preventing them from providing certain services until competitors had the opportunity to provide similar services in France and Germany, and preventing Sprint from being provided with either more favorable access to FT and DT's networks or to sensitive pricing information that FT or DT might obtain in dealing with Sprint's competitors.³⁶

Foreclosure to raise costs to rivals

The main focus of economists writing on vertical foreclosure has been on the possibility that a vertical merger might raise costs to current rivals, as opposed to preventing new entry. This "Post-Chicago" literature on the potential for vertical mergers and restraints to "raise rivals' cost" is far too extensive to review or discuss here,³⁷ beyond making a few comments that relate to their implications for the Vertical Merger Guidelines.

The first issue is the extent to which the raising rivals' cost (RRC) literature provides effective guidance to policy as opposed to developing theory that improves our understanding of the possible motives and effects of vertical control. To improve policy, the insights of the RRC writers must be implementable with a sufficiently low rate of false positives, or else even "good economics" can lead to "bad rules" (see Joskow, 2002). One way to reduce false positives would be to require a finding of *ex ante* market power at the primary stage, as opposed to lock-in or other *ex post* effects, especially since vertical mergers and other forms of vertical control can be an efficient *ex ante* response to potential market power *ex post* (see Williamson, 1975). A second point derives from the fact that guidelines perform two functions: they inform parties which economic "scenarios" the Agencies will take seriously when considering potential anticompetitive effects (e.g., raising entry barriers, collusion, regulatory evasion) or efficiencies (e.g., counteracting the incentive to free ride). Second, they provide necessary conditions for anticompetitive effects, and often numerical screens for safe harbors. Success in the latter

function does not require completeness in the former if the omitted anticompetitive scenarios have the same necessary structural conditions. Thus while “post-Chicago” scenarios may differ, to the extent that they require similar structural conditions, i.e., monopoly power at the primary level and entry barriers at the secondary level, omission of any discussion of RRC scenarios in the Guidelines may not create much of a false negative problem.³⁸ Moreover, there is nothing to stop either of the Agencies from bring an action based on a RRC theory, even if that theory is not spelled out in the Guidelines.³⁹

Third, however, a number of recent cases have shown that the kinds of concerns raised in the RRC literature may have a far wider applicability than were originally credited. The RRC literature has been criticized as failing to identify clear instances where vertical mergers or restraints have increased the production costs of rivals.⁴⁰ In a number of recent cases, however, it has become clear that a number of vertical strategies can and have been used by dominant firms to reduce the amount that downstream firms are willing to *pay* per unit for their rivals’ products to far below the price received by the dominant firm for an equivalent product, and thus block entry or drive out rivals at the primary level. One clear example of such a “reducing rivals’ revenue,” (RRR) strategy was Microsoft’s successful use of per-processor (CPU) contracts with OEMs to drive out DRI’s DR-DOS product from the market for operating systems for PCs.⁴¹

In this and similar cases, the critical condition for a dominant firm to reduce competition using vertical restraints is that at least some of the dominant firm’s product must be essential to the downstream firms.⁴² The strategy is thus effective even if entry into the downstream stage is easy. Incorporating RRC or RRR considerations into the Guidelines would thus require some widening of the sufficient conditions at the secondary level. It is also necessary to make clear that ease of entry should be assessed with respect to the product under consideration.⁴³ For example, efficient entry into the distribution of one’s own product may require distribution of many other products. Barriers can become economically insurmountable when access on non-discriminatory terms to the dominant firm’s product is critical to efficient operation at the downstream stage.

Incorporating these concern into the Guidelines would also require using measures of concentration at the primary level, such as the market share of the dominant firm, that recognize that a vertical merger intended to exclude or foreclose rivals at a vertically-related level by raising rivals’ costs or reducing rivals’ revenue would require unilateral (but not secure) monopoly power. Indeed, given that its rivals could hardly be expected to cooperate in its exclusionary strategy and that high concentration among the remaining firms might facilitate countering tactics, use of the HHI seems particularly inappropriate.⁴⁴

Finally, however, even if it may eventually be desirable to alter the Guidelines to reflect new analysis, that time may not be now. The most obvious reason (or excuse) for delay is that our understanding of vertical control may not have reached the point where applying what we now know will do more good than harm.

A second reason flows from the fact that foreclosure and exclusion strategies must first harm

competitors in order to eventually harm consumers. Private antitrust litigation by competitors who may be as well or better informed and financed than the Agencies may thus provide an effective, or at least adequate, substitute for governmental action.⁴⁵

A third, less charitable reason flows from the fact that most anticompetitive goals achievable through vertical mergers can be also achieved through vertical integration *de novo* (i.e., internal expansion) or by contractual vertical restraints. Indeed, exclusion is usually much more efficiently achieved through contract, as long as those contracts are legally enforceable and, of course, can survive antitrust challenge. It would have been prohibitively expensive for Microsoft to buy all the OEMs with whom it entered into CPU licenses or other restrictive agreements. Similarly, it would be prohibitively expensive for Philip Morris to buy all 300,000 retail stores with whom it was alleged in a recent case to have signed restrictive agreements limiting the ability of its rivals to communicate critical point-of-sale information to their customers. The successful implementation of such strategies by dominant firms, effectively unchecked by either public or private enforcement of the antitrust laws, implies that we may need not be greatly concerned about dominant firms using vertical acquisitions to exclude their rivals until we are sufficiently effective at blocking exclusionary vertical restraints that would achieve the same goal. The parallel with horizontal mergers is that we would probably not need much in the way of horizontal merger policy if horizontal price-fixing were legal and enforceable by contract.

(b) Acquiring an additional monopoly: leveraging.

It was, however, the Chicago School argument that leveraging, as opposed to foreclosure, was, if not impossible in theory, then too rare in practice to warrant intervention that generated the most controversy. This was the famous “impossibility” dictum that “there can be only one monopoly profit”,⁴⁶ with its attendant implications that (1) vertical integration by a monopolist into a competitive complementary level (whether upstream or downstream or just sideways) cannot be harmful and can be profitable only if efficient and (2) vertical integration by a monopolist into a non-competitive complementary level is always beneficial, since it eliminates successive monopoly.

The Guidelines are silent on leveraging. One interpretation is that the authors believed, as above, that leveraging to acquire a second monopoly at a competitive complementary level is economically implausible, while leveraging to acquire a second monopoly at a monopolized level is beneficial. A more general interpretation is that the authors believed that attempting to screen for and prevent anticompetitive leveraging would impose a cost in false positives that would greatly exceed any gains. Certainly the authors of the ‘82 Guidelines were well aware of the extensive literature in economics that had already appeared by then that showed that both of the above theorems were conditional on a large number of critical assumptions – in particular that monopoly power at the primary level was both secure and unconstrained and that the products were used in fixed proportions.⁴⁷

A case can be made that neither of these critical assumptions, however clear in theory, provided a basis for a leveraging screen in the Guidelines, at least at the time, but both are worth briefly

reviewing here, along with more recently developed leveraging scenarios that would be worth considering.

Dropping the assumption of a secure monopoly at the primary level affects both leveraging theorems. With respect to the first theorem, a firm without a secure monopoly at the primary level, or simply a bad case of paranoia, may, as noted above, seek to monopolize an otherwise-competitive complementary level to provide a “backup” monopoly (e.g., IBM in mainframe hardware and operating systems).⁴⁸ Similarly, with respect to the second theorem, a vertical merger among successive monopolies may, as discussed above, result in higher prices if it forestalls mutual entry.

Moving from successive monopoly to successive oligopoly also moderates and can even reverse the expected effect of a vertical merger on prices and welfare. Under some conditions, mergers among successive or complementary oligopolists still results in lower prices and increased output,⁴⁹ while under other conditions mergers among complementary oligopolists can be harmful to consumers.⁵⁰ Again, these findings do not imply a revision to the Guidelines, but rather that the standard “successive monopoly” defense of vertical mergers when market power is present at both stages should be treated with considerable caution or even scepticism.

The effect of dropping the fixed proportions assumption has similarly ambiguous implications for policy. A long series of articles have examined the incentives for a firm with monopoly or market power at one level to vertically integrate, de novo or through merger, into a competitive complementary product with which the monopolized product can be used in variable proportions. By allowing the monopolist to suppress the distortion in factor proportions induced by the supra-competitive pricing of the monopolized input or component, vertical integration both eliminates an inefficiency and increases the market power of the monopolist. Not surprisingly, the result can be either higher or lower prices to consumers, and either increased or decreased total welfare, depending on the particular parameter values and market structure.

Given that the welfare effects from controlling input substitution through vertical integration are both ambiguous and likely to be small, a reasonable argument can be made that the potential for vertical integration to harm consumers should be recognized, but that this potential harm does not pose a problem that can or should be redressed, especially in a Guidelines framework.⁵¹

Perhaps the best candidate for introducing a leveraging scenario into the Guidelines involves dropping the implicit assumption in the traditional (pro and anti) leveraging models that the secondary stage is a critical complement only to the monopolized primary stage. Even if there is no “second monopoly profit” to be earned in gaining an additional monopoly over the currently-competitive supply of product B for use with the already-monopolized product A, suppose that B is also an essential complement to product C, and the amount of B demanded for use with C is too small to support a minimum viable scale operation producing B just for the C market. Vertical integration by the A monopolist into B will then give the monopolist of A monopoly power in a “third market”, the sale of B to firms producing C (or to firms using C). Vertical integration will be profitable even if A and C are independent in demand, and even more profitable and harmful

to consumers if A and C are demand-side substitutes.⁵²

1. Principal, MiCRA. I would like to express my thanks for helpful comments to William Kolasky, Steve Silberman, Glenn Woroch, Sirdar Dalkir and Ronald Alepin.

2. The statement accompanying the '92 Guidelines stated that Section 4 of the 1984 Guidelines continued to provide the relevant guidance for vertical mergers, and there is general agreement that the Vertical Merger Guidelines remain in force. See, e.g., Morse (1998).

With guidelines, lack of revision usually means lack of interest. Thus, some might believe that the Non-Horizontal Guidelines died from boredom – at the zenith of the Chicago School, did we really need Guidelines on how not to intervene in vertical or conglomerate mergers?

In actuality, interest in vertical issues was always high, but mainly in vertical restraints and, most of all, resale price maintenance. One's position on RPM was almost a litmus test of antitrust soundness for both sides, a role currently played by Raising Rivals Cost (RRC) or other "Post-Chicago" theories. Much of the economic analysis that might have been reflected in a revised vertical merger guidelines appeared in the 1985 Vertical Restraint Guidelines, a document so politically radioactive that their repeal in 1993 was one of the first act of the next administration. While regarded as radically conservative in its day, the VRGs would probably be considered mainstream today.

3. Here, as elsewhere in Section 4, these numerical values should probably be inflated to match the inflation in practice of HHIs or leading firm share as the threshold for what constitutes a sufficiently concentrated market or sufficient monopoly (or dominant firm) power to warrant challenge of a horizontal merger. For estimates of HHI inflation, see Scheffman (2002), Section VIII.

4. Using the terminology of the '92 Guidelines, an "actual potential entrant" could be defined as a firm that qualifies as a "committed entrant" in the Entry Section, but has a high probability of entry at the current price (and thus would be still profitable even at the lower, post-entry price) rather than a high probability of entry at a post-merger price (and thus would only be profitable at the current, pre-merger price).

5. This allows me to segue the reader to Jonathan Baker's paper on entry in this volume.

6. Or so responded a manager of a Staples office supplies store when asked how the possibility that Office Depot would open a store in his neighborhood affected his pricing. His answer might have been different, of course, if his customers had been willing and able to enter into long-term contracts with the potential entrant at prices above the expected post-entry level, or otherwise cooperate to encourage entry. For a discussion of potential entry in *Staples*, see Dalkir and Warren-Boulton (1999)

7. The '92 Guidelines treatment of firms that can enter without the expenditure of "significant" sunk costs as already "in" the market implies that such firms are currently constraining prices in

that market. This presumably restricts the set of “perceived potential entrants” to firms who would have to incur “significant” sunk cost to enter.

8. The Guidelines’ analysis of mergers among “vertical” or “vertically-related” firms refers to any mergers between two firms producing products that are complements in demand.

9. See Cournot (1838), Spengler (1950), or any textbook in industrial organization, e.g., “What is worse than a monopoly? A chain of monopolies” (Tirole, 1997, p.175).

10. Almost all interesting results in economics are due to critical and unrealistic assumptions. In solving economics mysteries and when refereeing articles, the rule is “cherchez l’assumption.”

11. Andy Grove of Intel even titled his book *Only the Paranoid Survive*.

12. A point that Microsoft is fond of making with respect to the software industry. See, for example, Evans, Nichols and Reddy (2002).

13. Perhaps the clearest example is IBM, whose apparently secure monopoly in mainframe hardware was challenged by several domestic and Japanese firms whose hardware product was designed to run with IBM’s mainframe operating system (OS). IBM was saved from facing effective competition through its efforts to make software code copyrightable, giving IBM property rights over the OS (and the ability to license those rights), and thus a monopoly in the mainframe OS market. IBM promptly began to shift its margins from hardware to software, in effect imposing a tax or vertical price squeeze on rival hardware suppliers, and announced that it was “becoming a software company.” Amdahl, Hitachi, Fujitsu and others have since exited the mainframe business.

14. One way to describe the conditions under which a merger between complementary monopolies would lead to lower prices is “successive monopoly without bilateral monopoly”, i.e., a sequence of monopolies, none of which has any monopsony power. See, for example, the review of the early literature in Machlup (1950), who concluded that “While it is possible to conceive of [such cases], it is doubtful whether such situations are very common.”

15. E-mail from Joachim Kempin to Bill Gates, 12/16/97, titled “As promised OEM pricing thoughts,” under the heading “who can derail this plan and MSFT counter tactics” (MS7 007196). Mr. Kempin also authored a memo in August 2000 (while he still headed OEM relations for Microsoft) complaining that Intel was encouraging OEMs to support the rival Linux operating system and funding development of new devices that would work with Linux, and recommending that OEMs who were not “friendly” with Microsoft should be hit “harder than in the past with anti-Linux actions.”(see “MS trial: Memo disallowed,” Reuters, June 3, 2002)

16. See also the discussion below, especially footnote 27, of the DOJ’s concerns in *Premdor*.

17. Vertical control includes control through ownership (vertical integration, whether through acquisition or internal expansion) and through contract (usually referred to as “vertical

restraints”) including exclusive dealing, exclusive territories, resale price maintenance (RPM), tying arrangements, and output taxes. See Warren-Boulton (1978) for a taxonomy of forms of vertical control.

18. There was one exception: imposing maximum resale prices (maximum RPM), which had, ironically, been condemned as *per se* illegal (at least until *Kahn*), was the only form of vertical control for which no credible *anti*-competitive scenario could be developed.

19. “...if an economist finds something – a business practice of one sort or other--that he does not understand, he looks for a monopoly explanation. And as in this field we are very ignorant, the number of ununderstandable practices tends to be very large, and the reliance on a monopoly explanation, frequent.” Coase (1972).

20. See Williamson (2002) for a history of this recognition at the Division. Guidelines codify current practice rather than innovate, although marinating times have varied widely.

21. “First, do no harm.”

22. See Brennan (1987) for a detailed exposition of AT&T’s use of leverage to harm competition in long distance telephony. We have gained a great deal of experience with this issue since 1982. Most of the recent action in this area has been due to the Telecommunications Act of 1996, and the accompanying 271 proceedings, which essentially offered the RBOCs permission to vertically integrate into long distance as the “carrot” or reward for allowing access by potential competitors – notably the downstream long distance providers – to their upstream facilities, an initiative that has engendered enormous amounts of analysis and litigation but very little competition to date.

One example of a vertical merger that was challenged by the Division out of concern for regulatory evasion was *U.S. v. MCI Communications Corp (BT/MCI)*. The concern was that integration would give British Telecom and MCI the ability and incentive to evade the FCC’s proportionate return policy (under which BT is required to send calls to U.S. carriers in the same proportion as it receives them from those carriers) and, as a result, raise the international settlement rate, or use private lines to send traffic between them outside the international accounting system, which would increase the incentive to raise the settlement rate. The outcome was a consent decree that imposed both increased transparency, in an effort to improve the ability of regulators to detect evasion, and a resale requirement that BT and MCI not send traffic outside the international accounting system until their competitors had similar abilities. See *Sunshine* (1995).

23. See Arrow (1962). But see Barzel (1968).

24. But see Williamson (1975), pp.11-13, for an exposition of how transactions costs can make even first-degree price discrimination welfare-reducing.

25. See Bowman (1973).

26. This description is taken from Sunshine (1995).

27. Both these concerns reflect an awareness that the firm most likely to enter or expand production in a market in response to collusive price increase is a firm with some market power (or at least pricing significantly above marginal cost) in a complementary market, even if there are no economies of scope between the two products or other efficiencies from vertical integration.

28. “The differences in vertical integration between the two firms create information asymmetries that would make it difficult for the firms to monitor and punish deviations from attempted coordination on the terms and sale of interior molded doorskins....The proposed acquisition would eliminate much of the information uncertainty by adding Premdor’s downstream market information to Masonite’s upstream market information, enhancing the combined firm’s ability to detect deviations by the [leading, already vertically-integrated] firm on any coordinated price increase” Competitive Impact Statement, U.S. v. Premdor, et.al., August 3, 2001.

29. Cement prices are readily observable, so that reductions in the market price of cement are subject to effective retaliation. Cement plants are subject to high fixed costs, so that, during recessions, with capacity utilization falling and cement prices sticky downward, incremental profit margins widen. Unable or unwilling to use cement price cuts to increase cement sales, cement companies simply purchased concrete companies that were buying from their rivals, and switched their source of cement. But buying up rivals’ customers (and their own, if necessary to prevent them being bought by a rival) does more than simply enrich the shareholders of cement companies: since concrete prices are not readily observable, it allows the integrated firm to increase cement sales without decreasing the market price of cement. Consistent with this explanation, the one ubiquitous effect of these mergers was that they always resulted in the acquirer becoming the acquired concrete firm’s cement supplier. Perhaps the most telling evidence of the pro-competitive effect of these mergers is that cement companies as a group opposed these vertical acquisitions and appealed (successfully) to the FTC to block them. See McBride (1983).

30. It is important to understand that “barriers to entry” properly refer to the product in question, not to the downstream market, a point made clear in the late lamented Vertical Restraint Guidelines. See footnote 40, below.

31. Allegedly, the acquisition (or an equity investment by Microsoft) was first proposed by Netscape, and then responded to by Microsoft with an offer to forego creating browsers for operating systems other than the upcoming Windows 95 if Netscape opted out of the Windows 95 browser market. It is not obvious that the Agencies would have responded appropriately to either of these arrangements, or even that they would have recognized their potential for raising barriers to entry at the operating system level if Microsoft had not instead chosen to go to war with Netscape.

32. For a more detailed exposition of the model and its application to *Monsanto v. Spray-Rite*, see Warren-Boulton (1989, 1994).
33. To the downstream firm (e.g., a retailer), the effects on the profits of the upstream firm (e.g., a manufacturer) if it increases its efforts (e.g., devotes more shelf space to the manufacturer's product) is an "externality" which can be "internalized" only through merger or a non-linear pricing contract.
34. All these products are characterized by high fixed sunk costs, and thus high margins *ex post*, but not necessarily by large economies of scale *ex ante*. Thus, a TV network that owns a studio has a much stronger incentive to bias its choice toward that studio's products once they are "in the can" than to commission new product internally.
35. See, in particular, Yoo (2002) for an application of the Vertical Merger Guidelines to media mergers. Interestingly, Yoo describes the Vertical Merger Guidelines as "The ultimate testament to the triumph of the Chicago School's precepts" (p.201), although the fact that the Vertical Restraints Guidelines were promptly rescinded by the Clinton administration in 1993 might give the VRGs a better claim. See also Faulhaber (2002) for an analysis of the FCC's relief with respect to Instant Messaging in the AOL-Time Warner case.
36. This description is taken from Biggio (1996).
37. The "Post-Chicago" literature on the potential for vertical mergers and restraints to "raise rivals' cost" is enormous, with the seminal contributions by Williamson (1968) and by Salop [e.g., Salop and Scheffman (1983)].
38. For example, Krattenmaker and Salop (1986), pp 284-85, argue that the Vertical Merger Guidelines are "broadly" consistent with their approach, albeit incomplete in terms of anticompetitive theories and arbitrary in terms of threshold levels.
39. As indeed, the Department did in challenging the acquisition of McCaw by AT&T, where the concern was that the merger would give AT&T the ability to use its market power in the upstream market for cellular equipment (where the Division concluded that it had a dominant share in a concentrated market with high entry barriers and, critically, had "locked-in" RBOC customers) to limit the supply of equipment to the RBOCs, allowing McCaw to charge higher prices for cellular services. See Sunshine (1995).
40. For example, see Lopatka and Godek (1992).
41. See Baseman, Warren-Boulton and Woroch (1995).
42. For a list of necessary conditions for exclusion, see, for example, Baseman et.al., (1995), p.296.
43. As was made clear in the discussion of entry in the 1985 Guidelines for Vertical Restraints ("Vertical Restraint Guidelines"):

Finally, it should be noted that the ease of entry in distribution is assessed with respect to the product under consideration. Thus, for a product sold through supermarkets, the issue is the ease of entering the distribution of that one product – not necessarily the ease of entering grocery retailing. If, however, it is necessary to construct a chain of retailers in order to enter the distribution of a single product, then entry into the distribution of a product could be difficult in the sense that a very large price increase for the product would be necessary to induce entry. (Vertical Restraints Guidelines, p.33).

As a practical matter, barriers can become insurmountable when access on non-discriminatory terms to the dominant firm's product is critical to efficient operation at the downstream stage. For example, DRI could not counter the effects on DR-DOS from Microsoft's CPU licenses for MS-DOS by vertically integrating into the OEM stage. Nor can the smaller cigarette companies counter Philip Morris' use of exclusionary contracts with retailers by vertically integrating into retailing.

44. A similar argument has been made that the HHI is not the appropriate measure of concentration when considering potential unilateral effects from horizontal mergers when products are differentiated. See, for example, Werden and Froeb (1994).

45. It has become a cliché the antitrust laws are intended to help consumers, not competitors. Here the argument is that the antitrust agencies may not need to protect consumers if competitors are harmed enough.

46. "Vertically integrated monopolies can take but one monopoly profit...The gaining of a second monopoly vertically related to the first would not alter price, output or the allocation of productive resources on the second level monopolized." Bork (1951), pp 196-198.

47. To the best of my understanding, Bill Baxter hired me as Director of the EPO in 1983 only because he wanted to talk to someone about the effects of vertical integration with variable proportions, a problem that had interested him intellectually for some time. Discussion of the "variable proportions" scenario goes back at least as far as McKenzie (1951), and was recognized though discounted by Chicago School writers. Posner, for example, concluded that:
....the effect on the output of the final product is complex....Which effect dominates is an empirical question in each case, and probably an unanswerable one in the present state of economic science. (Posner, 1976, p.201)

It still is. Posner also argued that "such a merger should perhaps be viewed as basically horizontal in character, since it is equivalent to the input producer's acquiring the producers of the input that is substituted against his." (Posner, 1976, p.201). Technically, however, two inputs are gross substitutes (so that a merger between the two suppliers would be "horizontal" in character) only if the elasticity of substitution between the two inputs is greater than the elasticity of demand for the final product. See Hicks (1961), or Warren-Boulton (1978).

48. Here as elsewhere, however, this implies a greater emphasis on unilateral as opposed to collusive effects and thus the use of a more appropriate index than the HHI.

49. Salinger (1989), for example, analyzes a model where firms in each component compete via Cournot quantity setting, have identical conjectures, and take the other component market price as given. If the two components are used in fixed proportions, vertical mergers lead to higher industry output and lower prices. See also Economides and Salop (1992).

50. See Salinger (1989), and for a recent analysis assuming Bertrand competition with quality differentiated goods, see Dalkir, Eisenstadt, Gerstle and Masson (2002).

51. See Perry (1989), p.192: ("It is not clear that variable proportions raises a major policy issue on vertical integration."). Other leveraging scenarios may require conditions that may not be observed often enough, or may be too difficult to distinguish from efficiency scenarios, to warrant inclusion in formal guidelines (for a recent example, compare the discussion in Reynolds (2002) and the paper by Kolasky and Dick (2002) in this volume) especially since, as noted above with respect to RRC scenarios, nothing prevents the antitrust agencies from bringing a case based on a scenario that is not presented in the Guidelines.

52. See Whinston (1990) and related papers, e.g., Bernheim and Whinston (1998), where "C" is a "noncoincident" market, or Carlton and Waldman (1998), and Brennan and Kimmel (1986). Note that if A and C are perfect substitutes, this collapses to the standard foreclosure scenario presented in the Guidelines.

REFERENCES

Arrow, Kenneth J. "Economic Welfare and the Allocation of Resources for Invention," in *The Rate and Direction of Inventive Activity: Economic and Social Factors*, Princeton - NBER (1962).

Barzel, Yoram "Optimal Timing of Innovations," *Review of Economics and Statistics* 50 (August 1968): 348-55.

Bernheim, B. Douglas and Michael D. Whinston, "Exclusive Dealing," *Journal of Political Economy* 106,1 (1998): 64-92

Baseman, Kenneth, Frederick R. Warren-Boulton and Glenn Woroch, "Microsoft Plays Hardball: Use of Nonlinear Pricing and Technical Incompatibility to Exclude Rivals in Operating Software," *Antitrust Bulletin*, 40,2 (Summer 1995): 265-315.

Biggio, Charles E. "Merger Enforcement at the Antitrust Division," Address to the Chicago Bar Association, May 15, 1996.

Bork, Robert H. "Vertical Integration and the Sherman Act: The Legal History of an Economic Misconception," *University of Chicago Law Review* 22 (Autumn, 1951): 157-201.

Bowman, Ward S. Jr. *Patent and Antitrust Law: A Legal and Economic Appraisal*. University of Chicago Press, 1973.

Brennan, Timothy J. "Why Regulated Firms Should be Kept out of Unregulated Markets: Understanding the Divestiture in U.S. v. AT&T," *Antitrust Bulletin* 32 (1987): 741

Brennan, Timothy J., and Sheldon Kimmel, "Joint Production and Monopoly Extension through Tying," *Southern Economic Journal* 53,2 (October 1986): 490-501.

Carlton, Dennis W. And Michael Waldman, "The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries," NBER Working Paper 6831, (1998).

Coase, Ronald H. "Industrial Organization: A Proposal for Research", in *Policy Issues and Research Opportunities in Industrial Organization*, Victor R. Fuchs ed., NBER, 1972: 59-73.

Cournot, A. (Ed), *Mathematical Principles of the Theory of Wealth*. Augustus M. Kelley. New York (1971), Chapter IX.

Dalkir, Serdar, David Eisenstadt, Ari Gerstle and Robert T. Masson, "Complementary Goods, Monopoly vs. Monopoly Power: A Reassessment of Merger Effects," (2002).

Dalkir, Serdar, and Warren-Boulton, Frederick R., "Prices, Market Definition and the Effects of Merger: Staples-Office Depot (1997)," in *The Antitrust Revolution: Economics, Competition and Policy*, John E. Kwoka and Lawrence J. White, eds., Oxford University Press, Third edition, 1999.

Economides , Nicholas and Steven Salop, "Competition and Integration Among Complements, and Network Market Structure," *Journal of Industrial Economics*, 40,1 (March 1992) 105-123.

Evans, David, Albert Nichols and Bernard Reddy, "The Rise and Fall of Leaders in Personal Computer Software", in *Microsoft, Antitrust and the New Economy: Selected Essays*, Kluwer Academic Publishers Group, Netherlands, 2002.

Hicks, John R. Marshall's Third Rule: A Further Comment. *Oxford Economic Papers* 13 (October 1961): 261-65.

Kolasky, William J. and Andrew R. Dick, "The Merger Guidelines and the Integration of Efficiencies into Antitrust Review of Horizontal Mergers," (2002).

Krattenmaker, Thomas G., "Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power Over Price," *Yale Law Journal* (1986)

Lopatka, John E. And Paul Godek, "Another Look at Alcoa: Raising Rivals' Costs Does Not Improve the View," *Journal of Law and Economics*, 35 (1992): 311-30. Reprinted in *Famous*

Fables of Economics, Daniel F. Spulber, ed., Blackwell, 2002.

Machlup, Fritz, and Martha Tauber, "Bilateral Monopoly, Successive Monopoly, and Vertical Integration," *Economica* 27 (May, 1960): 101-119.

McBride, Mark E., "Spatial Competition and Vertical Control with Variable Proportions," *American Economic Review* 73 (1983): 1011-22.

McKenzie, Lionel W. "Ideal Output and the Interdependence of Firms," *Economic Journal* 61 (December, 1951): 785-803.

Morse, Howard, "Vertical Mergers: Recent Learning", 53 *Business Law* 1217, 1224 (1998)

Perry, Martin K. Vertical Integration: Determinants and Effects," in *Handbook of Industrial Organization* 183, Richard Schmalensee and Robert D. Willig, eds., 1989

Posner, Richard A. *Antitrust Law: An Economic Perspective*. The University of Chicago Press, 1976.

Reynolds, Robert J., and Janusz A. Ordover. "Archimedean Leveraging and the GE/Honeywell Transaction," *Antitrust Law Journal* 70,1 (2002)

Salinger, Michael A. "The Meaning of 'Upstream and Downstream' and the Implications for Modeling Vertical Mergers," *Journal of Industrial Economics* 37,4 (January 1989): 373-387.

Salop, Steven C. And David T. Scheffman, "Raising Rivals' Costs," *The American Economic Review* (May 1983): 267-271.

Scheffman, David, Malcolm Coate and Louis Silva, "30 Years of Merger Guidelines Enforcement at the FTC: An Economic Perspective." (2002)

Spengler, Joseph J., "Vertical Integration and Antitrust Policy," 58 *Journal of Political Economy* 357 (1950)

Sunshine, Steven C. "Vertical Merger Enforcement Policy," Address before the American Bar Association, April 5, 1995.

Tirole, Jean, *The Theory of Industrial Organization*, MIT, 1988.

Warren-Boulton, Frederick R. *Vertical Control of Markets: Business and Labor Practices*, Ballinger, 1978

Warren-Boulton, Frederick R. "Resale Price Maintenance Reexamined: *Monsanto v. Spray-Rite* (1984)," in *The Antitrust Revolution: The Role of Economics*, John E. Kwoka and Lawrence J.

White, eds., First Edition (1989), Second Edition (1994), Harper Collins: 400-431.

Werden, Gregory, and Luke Froeb, “The Effects of Mergers in Differentiated Products Industries, Logit Demand and Merger Policy,” *Journal of Law, Economics and Organization* 10 (1994),

Whinston, Michael D., “Tying, Foreclosure and Exclusion,” *The American Economic Review* 80,4 (Sept. 1990), 837-859.

Williamson, Oliver E., ”The Merger Guidelines of the US Department of Justice,” (May 21, 2002)

Williamson, Oliver E. *Markets and Hierarchies: Analysis and Antitrust Implications, A Study in the Economics of Internal Organization*. The Free Press, 1975.

Williamson, Oliver E., “Wage Rates as a Barrier to Entry: The Pennington Case,” *Quarterly Journal of Economics* 82 (February, 1968): 85-116.